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## SYSTEM OUTAGE MONITOR

### Status Report On Experimental Development

In the results of interest shown by 226 power companies in the Survey Outage Monitor, it was determined that further development of the device would be worth while.

## SYSTEM OUTAGE MONITOR

The Springfield Electric Company in North Adams, Massachusetts spent several years developing a device to notify the office maintenance crew, or other office personnel whenever an electrical circuit or equipment would become disconnected from the distribution system.

### Status Report On Experimental Development

This invention made it possible for maintenance personnel to restore service with a minimum of delay thus insuring continuity of service to all consumers. As soon as service was restored, the office personnel was to be notified of the fact that the fault has been cleared and service was back to normal operation.

At present, the equipment consists of a carrier current transmitter, a carrier current receiver, both housed in weatherproof enclosures and associated devices for coupling to the 2500 volt distribution lines, generally at the substation. There is a special indicator panel that is merely located in the telephone office, or wherever the notification of the outage is desired. These panels are located throughout the distribution and long distance called "translators". These panels are located beyond each transformer service or some place where there is a service transformer installed for local monitoring.

July 1950

The indicator panel, generally located in the telephone office and connected to the carrier current receiver by telephone lines, has switches and red and green lamps associated with each sectionalizing device that is to be monitored. The panel may also be provided with additional lamps for directly mounting on large switch boxes or each sectionalizing fixture. An alarm is also provided in the indicator that gives an early cue of the failure of the power lines to the consumer.

U. S. DEPARTMENT OF AGRICULTURE

RURAL ELECTRIFICATION ADMINISTRATION

TECHNICAL STANDARDS DIVISION

SYSTEM OUTAGE MONITOR

System Report On  
Experimental Development



1980

July 1980

U. S. DEPARTMENT OF COMMERCE  
NATIONAL ELECTRIFICATION ADMINISTRATION  
TECHNICAL STANDARDS DIVISION

1980

## SYSTEM OUTAGE MONITOR

### Status Report On Experimental Development

As the result of interest shown by REA borrower cooperatives in the System Outage Monitor now under development, the following non-technical summary of the equipment has been prepared.

The Sprague Electric Company of North Adams, Massachusetts has spent several years developing a device to notify the radio dispatcher, maintenance chief, or other office personnel whenever any oil circuit recloser, fuse, or sectionalizer locks open on the distribution system. The notification would identify the location of the device which opened. This immediate notification of system power outages would permit the cooperative personnel to restore service with a minimum of delay thus improving continuity of service to all consumers. As soon as service was restored, the office personnel was to be notified of the fact that the fault has been cleared and service was back to normal operation.

At present, the equipment consists of a carrier current transmitter, a carrier current receiver, both housed in weatherproof enclosures, and associated devices for coupling to the 7200 volt distribution lines, generally at the substation. There is a special indicator panel that is usually located in the cooperative office, or wherever the notification of the outages is desired. There are also installed throughout the distribution system devices called "modulators." One of these devices is installed beyond each sectionalizing device (at some place where there is a service transformer installed) that is to be monitored.

The indicator panel, generally located at the cooperative office and connected to the carrier current receiver by telephone lines, has switches and red and green lamps associated with each sectionalizing device that is to be monitored. The panel lamps can also be paralleled with additional lamps for directly mounting on large system maps at each sectionalizing location. An alarm is incorporated in the indicator that sounds off each time one of the sectionalizing devices locks open. This notifies the person doing the supervising. He throws a switch to turn off the alarm and notifies the proper main-

## SYSTEM OUTAGE MONITOR

Status Report On  
Executive Development

The system has been designed to run off of a single power source. It contains a battery which provides power to the system during power outages. The system also has a built-in generator which provides power to the system during power outages.

The system is designed to monitor the status of various components such as power supplies, memory modules, and drives. It also monitors the status of the network interface card (NIC) and the hard disk drive. The system can detect if any of these components fail and automatically switch to a backup component. The system also has a built-in diagnostic tool that allows the user to check the status of all components and troubleshoot any problems that may arise. The system is designed to be user-friendly and easy to use. It includes a graphical user interface (GUI) that allows the user to easily navigate through the system's menus and options. The system also includes a help menu that provides information on how to use the system effectively.

The system is designed to be highly reliable and fault-tolerant. It features redundant power supplies, redundant network interfaces, and redundant hard disk drives. The system also includes a built-in redundancy feature that allows the user to easily switch between different components if one fails. The system is designed to be highly reliable and fault-tolerant. It features redundant power supplies, redundant network interfaces, and redundant hard disk drives. The system also includes a built-in redundancy feature that allows the user to easily switch between different components if one fails.

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tenance crew. When service is restored, the alarm again sounds, requiring the supervisor to throw the switch back to the normal position. Thus proper records can be maintained of duration of system outages.

The modulators installed out on the lines are constructed in a socket type meter case with glass cover. The installation is made on a modified meter loop. The modulators now under test are of two types: One is all electronic and consists of two ruggedized radio tubes and associated parts. Only one of these tubes has more than 6 volts on its elements. The other type of modulator is all mechanical and accomplishes the monitoring by means of a small synchronous motor and associated parts.

The Sprague Electric Company has progressed on this development to the point where five distribution systems are to be partially equipped with the Outage Monitor. From these installations information on the adequacy of design and durability will be determined.

Many REA cooperative managers have asked what will be the price of the equipment. When the development started, REA suggested that an average cost of \$100.00 for each sectionalizing device monitored would be a very attractive value. It is to be expected that the cost of the first commercial installations will be some what higher than the \$100.00 figure; however, it is hoped that the equipment cost will not exceed the cost of the circuit reclosers it is to supervise.

The installations now being made are for test purposes only. The equipment has not reached the point of development where it can be offered to REA borrowers as standard equipment. The data collected on these test installations will be used by the Sprague Electric Company to make the necessary modifications to the equipment to assure that it is sufficiently rugged and reliable for general rural power line service.





